

AL'TSHULER, V.S.; LAVROV, N.V.; PITIN, R.N.; FARBEROV, I.L.; SHAFIR, G.S.

Underground gasification of coals under high pressure. Trudy IGI  
13:75-82 '60. (MIRA 14:5)

(Coal gasification, Underground)

GOLGER, S.P.; DERMAN, B.M.; LAVROV, N.V.; FARBEROV, I.L.; FEDOROV, N.A.

Production of industrial gas in the underground gasification of  
Lisichansk coals. Trudy IGI 13:83-86 '60. (MIRA 14:5)  
(Lisichansk—Coal gasification, Underground)

KRUKOVSKIY, V.K.; PITIN, R.N.; FARBEROV, I.L.

Combustion and gasification of oil shale in a channel. Trudy IGI  
13:87-96 '60. (MIRA 14:5)  
(Coal gasification, Underground) (Oil shales)

KRUKOVSKIY, V.K.; PITIN, R.N.; FARBEROV, I.L.

Gas formation during the gasification of oil shales in a channel.  
Trudy IGI 13:97-102 '60. (MIRA 14:5)  
(Coal gasification, Underground) (Oil shales)

KREYNIN, Ye, V.; FARBBEROV, I.L.

Efficient hydrodynamic regime for the process of displacement of the  
combustion focus in a coal bed toward connecting boreholes. Trudy IGI  
13:125-130 '60. (MIRA 14:5)

(Coal gasification, Underground)

MIROYEDOVA, Ye.V.; FARBEROV, I.L.

Products obtained in the process of the direct heating of coal by  
the electric current. Trudy IGI 13:158-163 '60. (MIRA 14:5)  
(Coal gasification)

LOSEV, B.I.; MEL'NIKOVA, A.N.; PITIN, R.N.; FARSEROV, I.L.

Volatility of germanium in coals. Trudy IGI 13:164-166 '60.  
(MIRA 14:5)

(Germanium)

(Coal)

DERMAN, B.M.; ROGAYLIN, M.I.; FARBEROV, I.L.

Kinetics of the process of interaction of carbon with steam. Trudy  
IGI 16:151-155 '61. (MIRA 16:7)  
(Carbon) (Steam) (Chemical reaction, Rate of)



DERMAN, B.M.; ROGAYLIN, M.I.; FARBEROV, I.L.

Change of the internal surface of electrode carbon during its reaction  
with steam. Trudy IGI 16:156-158 '61. (MIRA 16:7)  
(Electrodes, Carbon) (Steam)

CHEN LU-SHEN; ROGAYLIN, M.I.; FARBEROV, I. I.

Interaction of steam with coke obtained from Lisichansk coal.  
Trudy IGI 16:159-163 '61. (MIRA 16:7)  
(Coal gasification, Underground) (Steam)

FARBEROV, I.L.

Brief survey of the research work of the Institute of Mineral Fuels  
of the Academy of Sciences of the U.S.S.R. on the underground  
processing of fuels. Trudy IGI 16:248-261 '61. (MIRA 16:7)  
(Coal gasification, Underground)

KRUKOVSKIY, V.K.; MIROYEDOVA, Ye.V.; PITIN, R.N.; FARBEROV, I.L.

Hydrodynamic characteristics of a seam of kukersite oil shales. Trudy  
IGI 16:262-267 '61. (MIRA 16:7)

(Oil shales) (Hydrodynamics)

KIRICHENKO, I.P., kand. tekhn. nauk; PITIN, R.N., kand. tekhn. nauk;  
PARBEROV, I.L., doktor tekhn. nauk; FEDOROV, N.A., kand. tekhn.  
NAUK

Some problems in recovery without mining and in underground  
preparation of fuels and other minerals. Nauch. trudy  
VNIIPodzemnaya no.873-10 '62. (MIRA 16:6)

1. Institut goryuchikh iskopayemykh Gosudarstvennogo komiteta  
po toplivu i Vsesoyuznyy nauchno-issledovatel'skiy institut  
podzemnoy gasifikatsii ugley.  
(Coal gasification, Underground)  
(Sublimation(Physical sciences))

1, 15204-65 EWT(m)/EPF(c)/EPR/EMP(j)/T-2 Pa-4/Pc-4/Pr-4/Ps-4 ASD(m)-3  
 (mp)-2 WM/MLK/RM  
 ACCESSION NR: AT4048187 S/0000/64/000/000/0012/0016

AUTHOR: Mishchenko, M. L.; Farberov, L. L. (Doctor of technical sciences, Professor); Bogdanov, I. F. B+1

TITLE: Investigation of the pyrolysis of linear polymers under the influence of flash heating

SOURCE: AN SSSR. Institut goryuchikh iskopayemykh. Gazifikatsiya i piroliz topliv (Gasification and pyrolysis of fuel); sbornik statey. Moscow, Izd-vo Nauka, 1964, 12-16

TOPIC TAGS: pyrolysis, linear polymer, polystyrene, polyethylene, synthetic rubber, coke, flash heating

ABSTRACT: The pyrolysis of linear polymers such as polystyrene, polyethylene and synthetic rubber under the influence of flash heating was investigated and the typical analytical data for an emulsion polystyrene, type B, obtained at 600-1200C are tabulated. The yield in coke residue of pyrolysis increases with an increase in the temperature of flash heating. This is especially clear at 1200C, at which the coke residue yield increased to 65%, and the liquid resin yield decreased to 18% by weight. The rate of gas evolution during pyrolysis of polystyrene is constant at 800-1200C or higher, and the amount of evolving gas increases propor-  
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L 15204-65

ACCESSION NR: AT4048187

tionally with the temperature. In order to establish the relationship between the specific rate of gas evolution and the weight of the sample, pyrolytic experiments were carried out at 1000 and 1200C for 0.2 and 2.5 g samples. It was found in both cases that the rate of gas evolution decreased uniformly with increasing weight of sample. Equations are given for processing the experimental data. The calculated and experimental gas evolution rates for both temperatures are tabulated. The proposed equations permit calculation of the total amount of gas for samples of different weight during pyrolysis by flash heating at 1000 and 1200C. The pyrolysis of polyethylene differs considerably from that of polystyrene in that marked gas evolution is already found at 600C. With a further increase in temperature, the gas evolution increases. The data obtained here also show that the yield in coke residue during the thermal decomposition of an organic substance depends on the heating conditions. Concerning the reactions during the pyrolysis of synthetic rubber, the variation in the yield of the main gas components with increasing temperature of flash heating is important. The tabulated data show that with increasing temperature the amount of unsaturated compounds passes through a maximum while the hydrogen content of the gas steadily increases, especially after 1000C. The composition of the pyrolysis gases for these three polymers as determined by gas chromatography is tabulated. "I. V. Romanova also took part in the work." Orig. art. has: 6 tables.

Card 2/3

L 15204-65

ACCESSION NR: AT4048187

ASSOCIATION: none

SUBMITTED: 04Apr64

ENCL: 00

SUB CODE: 0C

NO REF SOV: 002

OTHER: 001

Card 3/3



L-15205-65 EPA(a)-2/EWT(m)/EPF(c)/EPR/EMP(j)/T-2/T Pc-l/Pr-l/Pa-l/Pt-10 RPL/  
OSD/ASD(p)-3 WW/MLK/RM S/0000/64/000/000/0025/0035  
ACCESSION NR: AT4048188

AUTHOR: Grebenshchikova, G. V.; Farbarov, I. L. (Doctor of technical sciences, Professor)

TITLE: Determination of the character of the heat effects during pyrolysis of polymers

SOURCE: AN SSSR. Institut goryuchikh iskopayemykh. Gazifikatsiya i piroliz topliv (Gasification and pyrolysis of fuel); sbornik statey. Moscow, Izd-vo Nauka, 1964, 25-30

TOPIC TAGS: polymer pyrolysis, polymethyl methacrylate, polystyrene, phenol-formaldehyde resin, thermogram, heat effect

ABSTRACT: The nature of the thermal effects during pyrolysis of polymethyl methacrylate, polystyrene and phenol-formaldehyde resin was investigated by thermographic methods. The thermal conversion of the polymers was studied in a range of 20-800C on the Kurnakov pyrometer, in a nitrogen current (50 cc/min.) and in air. The diagram and description of the apparatus are given. Resistance in the circuit of the simple thermocouple was 37,900 ohms, that of the differential thermocouple 600 ohms, initial current strength 4.2 amps, sample weight 0.4 g. The thermograms are given for a nitrogen current. A correlation was found between the character  
Card 1/2

L 15205-65

ACCESSION NR: AT4048188

of the thermograms and the nature of the substance. The pyrolysis of polymethyl methacrylate (PMA) and polystyrene (in powdered form) is accompanied by deep endothermic effects, at 420C for PMA and 460-470C for polystyrene, and by shallower effects at 620-650C. For polystyrene, the endothermic effect of pyrolysis is slightly shifted toward higher temperatures. This difference is due to the presence of the aromatic ring in the polystyrene chain. The thermogram of synthetic rubber differs from that of PMA and polystyrene. It was found that the nature of the substance affects the character of the differential thermograms considerably and determines the zones of exo- and endothermic effects. The greatest decomposition of polymethyl methacrylate is observed between 260 and 420C; for polystyrene, decomposition at 400-470C is characterized by the endothermic effect shown on the thermograms. Between 20 and 700C, PMA and polystyrene decompose completely. For phenol-formaldehyde resins, no clear exothermic effect corresponding to decomposition was found. Phenol-formaldehyde decomposes partially (43-45%) with the formation of a stable coke residue. The more heat stable a material, the simpler the thermogram. "The photorecording pyrometer of N. S. Kurnakov (FPK-55) was manufactured at the IGI AN SSSR." Orig. art. has: 4 figures.

ASSOCIATION: none

SUBMITTED: 04Apr64

Card 2/2 NO REF SOV: 009

ENCL: 00

OTHER: 005

SUB CODE: MT,TD

L 15663-65 EPA(s)-2/EWT(m)/EPF(c)/EPR/ENP(j)/T Pc-4/Pr-4/Ps-4/Pt-10 ASD-3/  
AFFTC/ESD-3/SSD/RPL/Pa-4/ASD(m)-3 RWH/WW/RM  
ACCESSION NR: AT4048189 S/0000/64/000/000/0031/0036

AUTHOR: Grebenshchikova, G. V.; Farberov, I. L. (Doctor of technical sciences, Professor) B-1

TITLE: Thermographic Investigation of some polymers and polycondensates

SOURCE: AN SSSR. Institut goryuchikh iskopayemykh. Gazifikatsiya i piroliz topliv (Gasification and pyrolysis of fuel); sbornik statey. Moscow, Izd-vo Nauka, 1964, 31-36

TOPIC TAGS: thermography, polymer, polycondensate, polyethylene, cellulose acetate, epoxide resin, pyrolysis

ABSTRACT: Polyethylene<sup>6</sup>, rubber, cellulose acetate<sup>7</sup> and epoxide resin<sup>15</sup> were investigated thermographically, and a search was made for a control sample which was similar to the given materials in nature (heat capacity, heat conductivity). A waxy polyethylene was used, the rubber was an unsaturated acyclic hydrocarbon containing the isoprene group, cellulose acetate was prepared by the esterification of cellulose with acetic acid anhydride in the presence of acetic acid and a small amount of sulfuric acid, and epoxide resin was prepared by condensation of epichlorohydrin with phenols, alcohols or amines. The experiments were carried out on the Kurnakov pyrometer, described in a previous paper, with a sample weight of Card 1/3

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ACCESSION NR: AT4048189

4

0.4000 g, initial current density 4.0 amps., resistance 37,900 ohms in the simple thermocouple and 6000 ohms in the differential thermocouple, time 60 min., rate of heating 16-18 degrees/min.;  $Al_2O_3$  and cokes of phenol-formaldehyde resin<sup>2</sup> and electrode carbon were used as the controls. The thermograms obtained during pyrolysis show three very characteristic thermal effects: 1) an endothermic effect connected with the removal of moisture and melting of the material; 2) an exothermic effect (260, 320-325, 350-355, and 360-375C, respectively, for each of the given materials), determined by the increase in heat conductivity during transition to the molten state; 3) an endothermic effect due to the maximum decomposition of the substance in the range of 350-550C. The nature of the differential thermal curves shows that the peculiar form of the thermograms depends on the nature of the material. The pyrolysis of polyethylene and cellulose acetate was accompanied by slight endo- and exothermic effects in the corresponding range of temperature. For rubber and epoxide resins, simplified thermograms with pronounced effects were obtained. On the basis of an analysis of the thermograms with different control samples, it is concluded that the clearest picture of pyrolysis is obtained using electrode carbon coke as control. The experimental data on the thermal effects of pyrolysis are tabulated. Orig. art. has: 4 figures, 1 table and 1 chemical equation.

Card 2/3

L 15663-65

ACCESSION NR: AT4048189

ASSOCIATION: none

SUBMITTED: 04Apr64

ENCL: 00

SUB CODE: OC, OC

NO REF SOV: 004

OTHER: 003

Card 3/3

L 27790-65 EWT(m)/EPA(s)-2/EPF(c)/T/EMP(j)/EPR Pc-L/Pr-L/Ps-L/Pt-L0 WW/DJ/RM  
ACCESSION NR: AP5004312 8/0191/65/000/002/0026/0028

AUTHOR: Bogdanov, I. P.; Grebenshchikova, G. V.; Losev, V. B.; Mishchenko, M. L.;  
Molchanov, B. V.; Farberov, I. L.

TITLE: Study of the thermal degradation of polychloroorganosiloxane polymers

SOURCE: Plasticheskiye massy, no. 2, 1965, 26-28

TOPIC TAGS: silicorganic polymer, organosiloxane, polychlorosiloxane, polymer thermal degradation, phenylsiloxane polymer, chlorinated polymer

ABSTRACT: The effect of chlorination of the phenyl radical on the thermal stability of polydimethylphenylsiloxanes was studied experimentally. The thermal properties of polydimethyl-, polydimethylchloro-, polydimethyldichloro- and polydimethyltrichlorophenylsiloxane were determined by recording the thermal effects of pyrolysis to 800C on Kurnakov's pyrometer, by measuring the pyrolytic weight loss to 1000C, and by analyzing the gaseous decomposition products generated up to 1000C. The non-halogenated polymer showed a small exothermic effect at 530C, while the chlorine-substituted specimen exhibited stronger exothermic effects at 550-565C, the height of the peaks increasing with the number of chlorine atoms. Chlorine

Card 1/2

L 27790-65

ACCESSION NR: AP5004312

0

containing specimens started to decompose at lower temperatures, and the rate of gas generation and the percentage of bonded chlorine split off as hydrogen chloride both increased with the degree of chlorination. The amount of hydrogen liberated as H<sub>2</sub> or methane as compared with the initial hydrogen content of the methyl groups decreased in the chlorinated polymers, indicating a shielding effect of chlorine with respect to the stability of the methyl. Generally, the thermal stability decreased with increasing chlorine content. Orig. art. has: 3 figures and 1 table.

ASSOCIATION: None

SUBMITTED: 00

ENCL: 00

SUB CODE: OC, GC

NO REF SOV: 002

OTHER: 002

Card 2/2

BOGLANOV, I.F.; VOLKOV, V.Z.; MOSIN, A.M.; FARBEN V. I.I., 1965, 18:8

Problems in the chemical processing of gases obtained from underground coal gasification. Trudy VNIIPodzemnaya no.13:26-31 '65.

(MIRA 18:8)

1. Institut goryuchikh iskopayemykh, Moskva.



ACC NR: AT6034951

(..N)

SOURCE CODE: UR/0000/06/000/000/0000/0000

AUTHOR: Krukovskiy, V. K.; Lekomskaya, G. V.; Dement'yeva, T. N.; Farberov, I. L.

ORG: none

TITLE: Use of electric gas discharges in fuel conversion processes

SOURCE: Moscow. Institut goryuchikh iskopayemykh. Termicheskiy i okislitel'nyy piroliz topliv i vysokopolimernykh materialov (Thermal and oxidizing pyrolysis of fuels and high polymer materials). Moscow, Izd-vo Nauka, 1966, 58-63

TOPIC TAGS: methane, thermal decomposition, electric discharge, activation energy , gas discharge, hydrocarbon

ABSTRACT: A review has been made of the use of electric gas discharges in conversion processes for fuels such coal and gaseous hydrocarbons. Inter alia, the review reports the results of a study of the effect of an electric gas discharge on the homogeneous gas-phase thermal decomposition of methane. Figure 1 shows the effect of the discharge on the temperature dependence of the activation energy of this reaction at 1200—2000C. As Figure 1 indicates, the discharge lowers the absolute value of the activation energy and causes the activation energy to increase with temperature. Orig. art. has: 2 figures. [WA-68]

Card 1/2

ACC NR: AT6034951

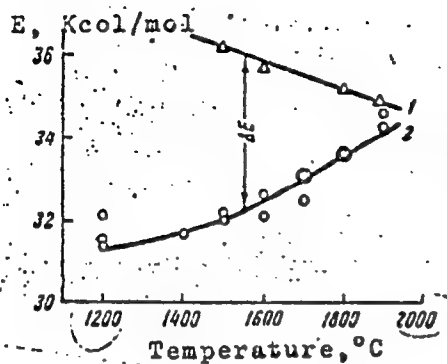


Fig. 1. Activation energy of thermal decomposition of methane versus temperature

1 - No discharge; 2 - discharge.

SUB CODE: 07, 21/ SUBM DATE: 23Jun66/ ORIG REF: 009/ OTH REF: 004

Card 2/2

FABEROV, M.A., inzh.

Stamping corrugated sheets. Mashinostroitel' no.4:30 Ap '58.  
(Sheet-metal work) (MIRA 11:5)

ACCESSION NR: AP4042337

S/0138/64/000/007/0007/0010

AUTHOR: Rumyantseva, Z. M., Golitsina, A. A., Farberov, M. A., Epshteyn, V. G., Lazaryants, E. G., Yemel'yanov, D. P., Kosmodem'yanskiy, L. V.

TITLE: Synthesis and use of butadiene methacrolein latexes

SOURCE: Kauchuk i rezina, no. 7, 1964, 7-10

TOPIC TAGS: tire manufacture, tire cord saturation compound, saturated cord bond strength, latex containing saturation compound, latex SKMA-3, butadiene methacrolein latex, aldehyde group content, polymerization process, latex synthesis, rubber SKS-30 AM, rubber NK, synthetic rubber, SBR rubber

ABSTRACT: Latexes were synthesized by copolymerization of butadiene and methacrolein at 5C in acid (pH 2.5-3.0) and alkaline (pH 10.0-10.5) media, with methacrolein in the initial emulsion varying from 1 to 30 parts by weight (recipos given). Conversion levels of 70% were attained and the kinetics of the process are described in detail. Compounds of the synthesized latexes with resorcinol-formaldehyde (RF) or glycol-resorcinol formaldehyde (FR-12) resins (12 parts by weight of resin per 100 parts of polymer) were used to saturate tire cords. The cords were then tested by multiple deformation, static peeling and N methods for the strength of their bond to resins from NK, SKB and SKS-30

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ACCESSION NR: AP4042337

AM rubbers. It was found that bond strength depends on the content of aldehyde groups in the latex and was best for a monomer mixture with 20% methacrolein by weight. Polymerization at 5C, a conversion level of 70%, Defo hardness levels of 1500 to 3000 g and the use of a rosin soap as an emulsifier promoted bond strength. Comparative evaluation of the synthesized latex, named SKMA-3, indicated it to be superior in bond strength over compounds based on carboxyl containing and vinyl pyridine latexes. Orig. art. has: 4 tables and 2 graphs.

ASSOCIATION: Nauchno-issledovatel'skiy institut monomerov dlya sinteticheskogo kauchuka (Scientific Research Institute for Synthetic Rubber Monomers); Yaroslavskiy tekhnologicheskii institut (Yaroslav Technological Institute); Yaroslavskiy shinny\*y zavod (Yaroslav Tire Factory)

SUBMITTED: 00

ENCL: 00

SUB CODE: MT

NO REF SOV: 010

OTHER: 003

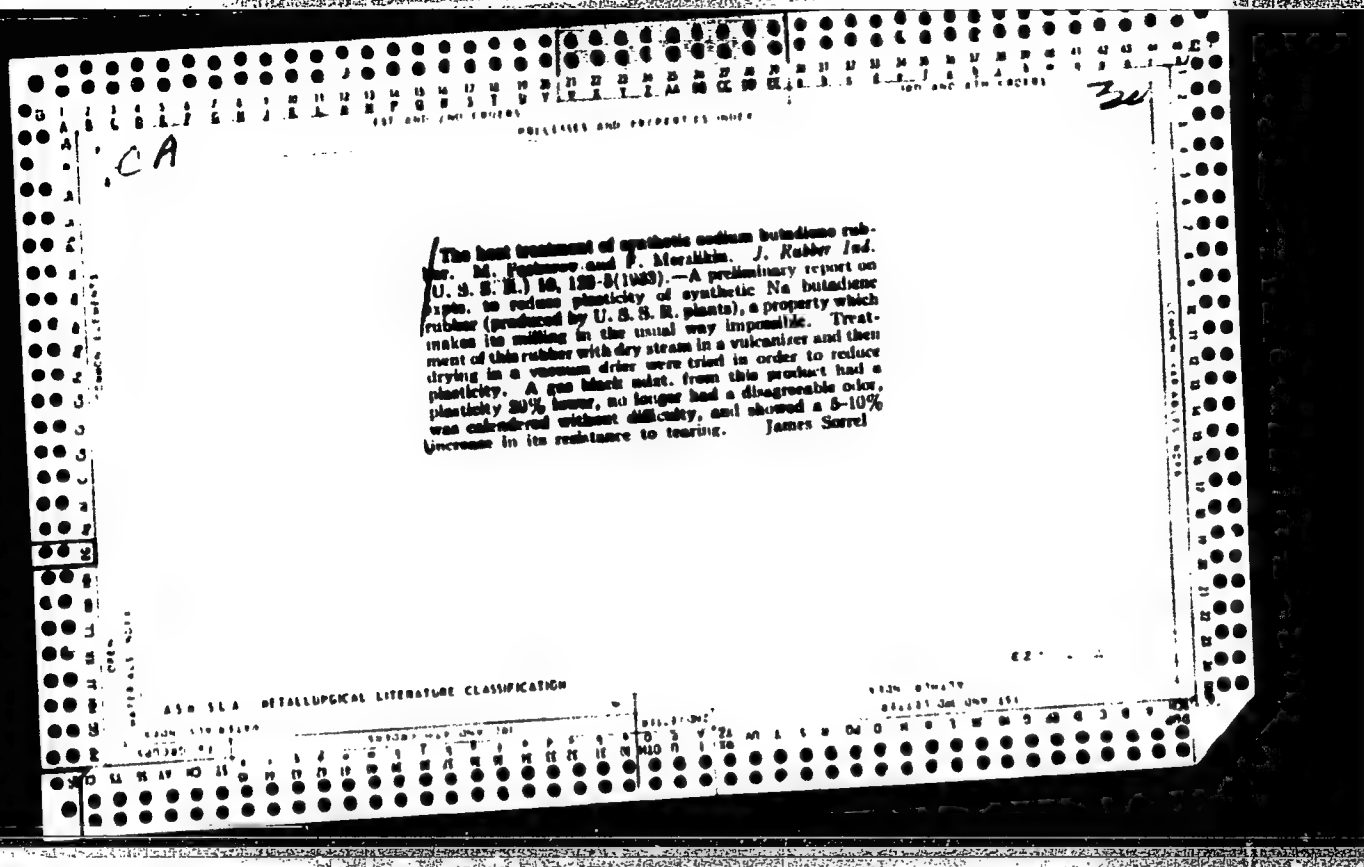
Card

2/2

FARBEROV, M.G.

Improve the work of disability evaluation experts. Zdrav. Bel.  
6 no.12:38-41 D '60. (MIRA 14:1)

1. Zaveduyushchiy otdelom vrachebno-trudovoy ekspertizy Ministerstva  
sotsial'nogo obshchestveniya Belorusskoy SSR.  
(WHITE RUSSIA--DISABILITY EVALUATION)



*Ca*

The properties of condensates formed by the action of foreign bodies on the condensation product of two carbon monoxides and three carbonyl compounds (K-1). M. Farkas and A. Kerecova. J. Rubber Ind. (U.S.S.R.) 18, No. 1, 26-9 (1964).—The condensates prepd. by the action of CMO on the condensation product K-1 are powders. Their m. p. is raised and their tendency to cause burning is reduced by increasing the quantity of CMO (from 0.5 to 2.0 mol; 1.5-2.0 mol. gave the best results).

János Szécsi

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COMMON WEAPONS INDEX

NATIONAL INDEX

ASB-35A METALLURGICAL LITERATURE CLASSIFICATION

RESEARCH REPORTS

COLLECTOR'S COPY



30

A method of obtaining nonadhesive lining material for the tire industry. F. Merzlikin, M. Farberov, and I. Poluzkin. *J. Rubber Ind.* (U. S. S. R.) 11, 232-4 (1934).—The following formulas are given (g. per kg. of final product): (1) gelatin 75, tech. glycerol 85, tak 30, dye of any color 10, water 800, and (2) 10% formaldehyde soln. The gelatin is dissolved in water at 80°, and while stirring the tak, glycerol and dye are added. The cotton is worked up with mixt. (1) from both sides and is dried; afterward the cotton material is worked into mixt. (2), dried again and put through a roller or calender. One thousand sq. m. of cotton material requires (in hg.): gelatin 37.5, glycerol (or polyglycol) 42.5, tak 15, dye 0.5 and formaldehyde 25.0.  
A. Petruš

PROCESSES AND PREPARED TO																																																																																																							
<p>The alkali process of reclaiming rubber M. I. Far-                      latov and V. Komarov. <i>J. Rubber Ind.</i> (U. S. S. R.)                      11, 317-43(1931). --A review of the alkali process of re-                      claiming rubber from tires, as used in the Yaroslavskii re-                      claiming plant A. Pestoff</p>																																																																																																							
<p>ALSO SEE METALLURGICAL LITERATURE CLASSIFICATION</p>																																																																																																							
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[illegible]

**Thermal plasticization of rubber.** M. Farhaty and Vn. Margolina. *J. Rubber Ind.* (U. S. S. R.) 12, 209 (1965); cf. C. I. 24, 4656. Smoked sheet was masticated on a mill. At first the plasticity increased, but after 20-30 min. of mastication it became const. The plasticity increased when thermal plastication was carried out in air increased when thermal plastication was carried out in  $N_2$  or in a special app. at 170°, 170° and 170° for 15, 30, 60, 90 and 120 min. The most effective temp. is between 170° and 170°. Thermal plastication in vacuum gave less effect, and the higher the vacuum the less the effect. In  $O_2$  and effect was 4 times more rapid than in air. In  $CO_2$ ,  $N_2$  and effect was very small (even this small effect was due to traces of  $O_2$ ). The main factor of thermal plastication is  $O_2$ . The amt. of  $O_2$  absorbed by rubber at 170° and 120 min. was not over 0.55%. Charts and photomicrographs are included. Rubber treated at 170° in  $CO_2$ ,  $N_2$  and  $NH_3$  is only partly sol. in  $C_6H_6$  even after 1 month. The heating does not increase the soly. A. Pe-stoff

CA

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ACTIVATION OF THE FILERS OF RUBBER MIXTURES. M. Far-  
beto. *J. Rubber Ind.* (U. S. S. R.) 12, 690 (1965).  
A crit. discussion of the work of Pisarenko and Mikhustin  
(C. A. 29, 7005).

ASD SEA METALLURGICAL LITERATURE CLASSIFICATION

CA 30

PROCESSING AND PROPERTIES INDEX

Thermal processing of rubber. Technological characteristics of the product of thermal plasticization. M. Vorobeyev and A. Sushakov. *J. Rubber Ind.* (U.S.S.R.) 18:918-922(1986); cf. C. A. 20, 7080; Gusev, Gurevich, Khovrinn and Tschikov, C. A. 20, 6797. Rubber was plasticized in an autoclave at 150°, cooled to 50° and passed 3 times through a mill (65-70°). The plasticity increased directly with the time of thermal treatment. The energy used was 15-50% less than that with mech. treatment. With a high proportion of rubber and a high plasticity, the economy is greater with thermal plasticization. The mech. properties of vulcanizates prep'd. from mech. and thermally plasticized rubber aged the same. The thermally treated vulcanizates absorbed less water and showed less roller effect; at plasticities of 2.5-2.75, their solns. gave lower viscosities and a plasticity of 1.8; a higher viscosity than solns. of mechanically plasticized rubber. Thermally plasticized rubber was used to prep. sponges, rubberized fabrics and frictions. Thermally plasticized rubber required a higher concn. of alkali for its water dispersion. A. Pestoff

ASB-51A METALLURGICAL LITERATURE CLASSIFICATION

1st and 2nd orders

PROCESSES AND PROPERTIES INDEX

Improving sodium butadiene rubber M. I. Larbatov and E. I. Merzhikov. Russ. 46,452, March 31, 1946. The rubber is heat-treated at 100° in a vapor, gas or air atm. in the presence of  $\text{SnCl}_4$ ,  $\text{ZnCl}_2$  or benzoyl chloride as polymerizing agents.

AVS SLA METALLURGICAL LITERATURE CLASSIFICATION

62201 6220170

6220170 6220170

CO- 30

RESISTANCE TO TEARING IS THE MOST IMPORTANT CHARACTER-  
ISTIC OF THIN-WALLED RUBBER GOODS. M. Farberov, J.  
Rubber Ind. (U.S.S.R.) 1936, 27:3 5. A discussion.  
A. Pestoff

ASS-SLA METALLURGICAL LITERATURE CLASSIFICATION



ca

30

**Rubber as an anticorrosive material.** M. Farley and A. Gurina. *J. Rubber Ind.* (U. S. S. R.) 1936, 28, 97. Tests of various types of vulcanizates, including reclaimed rubber, synthetic rubbers, Thiokol, etc., in air, water, 18 and 35% aq. HCl, 5 and 10% H<sub>2</sub>SO<sub>4</sub>, 85% H<sub>3</sub>PO<sub>4</sub>, 4, 8 and 17% HNO<sub>3</sub>, 10 and 70% AcOH, 15 and 50% NaOH, HF and NH<sub>4</sub>OH, for 8, 10 and 35 weeks are described. The tests included tensile strength, elongation, hardness and swelling. No butadiene rubber withstood the acids better than did natural rubber. Thiokol had no resistance to NaOH. Seven references. A. Prabh

ASB-5LA DETALLURGICAL LITERATURE CLASSIFICATION



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CM

It is too early to discard the plasticization of rubber  
M. Pastusov. J. Rubber Ind. (U. S. S. R.) 1936, No 1,  
49-50. A crit. discussion of an article by Kaplan (cf.  
preceding abstr.) A. Pestoff

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

20

Uniting rubber to metals. M. Parferyov, A. Gontina, I. Zueva, V. Myagkova and I. Grigor'eva. *J. Rubber Ind.* (U. S. S. R.) 1986, No. 8-9, 909-11. - *Thermoprene cement method*. - A thermoprene-CaH<sub>2</sub> cement (prepd. from smoked sheet and *p*-phenolsulfonic acid) was coated on the surface of the metal. Unvulcanized rubber was then attached, steam-vulcanized at 128° for 15 min and kept under 2 atm. air pressure till the temp. dropped to 70-80°. The adhesion to steel was 30 kg. per sq. cm. and to Al 40. Elevated temps. decreased the adhesion and at 90° it was 8 kg. per sq. cm. *Brass method*. - The chemically cleaned Fe was brass-plated (10  $\mu$  thick) and coated with a CaH<sub>2</sub> cement of rubber-C black. The layer of rubber was then vulcanized on this coating. The adhesion of natural rubber was 61 kg. per sq. cm., that of synthetic Na butadiene rubber 44 and of chloroprene rubber 85. The adhesion did not change from 20° to 110°. *Latex-albumin cement method*. - The mixt. used contained blood albumin 50-75 parts per 100 parts of latex (Revertex), S and accelerator, formaldehyde (a small proportion to make the cement more water-resistant) and a preservative. After coating, the metal was heated in air at 100-125° for 10-30 min., the unvulcanized rubber attached and vulcanized in a press. The adhesion to steel of natural rubber was 45 kg. per sq. cm., that of synthetic Na butadiene rubber 47, of chloroprene rubber 0; to Al (its surface was chemically treated to increase the surface of the contact): natural rubber 49, synthetic Na butadiene rubber 40. The adhesion did not change from 20° to 110°.

A. Prestoff

Open vulcanization in lining metallic and wooden apparatus and tanks with rubber. M. Farlerov, A. Gorina and L. Antonov. *Rubber and Rubber* (U. S. S. R.) 1937, No. 9, 48-51.—A description of the Vukach process. A. Pestov

117 AND 118 (ADP)

PROCESSES AND PROPERTIES INDEX

30

Twenty years. The main technological changes in practice in the Soviet rubber industry. Si. Fatharov. *Caoutchouc and Rubber* (U. S. S. R.) 1957, No. 11, 31-46. A. Pestoff

-A review.

ASPH 55.4 METALLURGICAL LITERATURE CLASSIFICATION

FARBEROV, M.I.

15  
3586. Alkylphenol-aldehyde resins for improving  
the tackiness of synthetic rubbers. Influence of  
structural parameters of the resins upon the tacki-  
ness. A. O. BILORUSSOVA, M. I. FARBEROV and  
V. O. ERSHTEIN. 'Prochnost' Beyak. ..., 1954, p.  
131-42. (Vses. Khim. Obshch. im. D. I.  
Mendeleeva, Dec. 1934). Cf. Rubb. Abs., 1957,  
abs. 2571. 3821/21.542(15)6

Mall's

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Rm

up

FARBEROV, M. I.

Math  
Chem

8245. Alkylphenol-sided resins for improving the tackiness of synthetic resins. II. Use of Yarrozin A and B to increase the tackiness of synthetic rubber mixes. V. O. ERSHTIN, A. G. BULOKOSSOVA and M. I. FARBEROV. *Prochnost Svyazi*, 1954, p. 143-50. (Conference of Vses. Khim. Obshch. in D.I. Mendeleev, Dec., 1954). After a short introduction, the text is as given in *Khim. Prom.*, 1954, 329-33, above.

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USSR/Chemistry - Synthesis

Card 1/1 Pub. 22 - '33/56

Authors : Farberov, M. I.; Tepenitsyna, E. P.; and Shemyakina, N. K.

Title : Synthesis of hydroxytetrahydropyran and its conversion products

Periodical : Dok. AN SSSR 99/5, 793-796, Dec 11, 1954

Abstract : The derivation of 4-hydroxytetrahydropyran (yield 75%) from the reaction of allyl carbinol with formaldehyde in an aqueous medium in the presence of acid, is described. Oxidation of the reaction product with chromic anhydride resulted in the formation of a ketone - tetrahydro-gamma-pyrone- which was found to be identical to the ketone obtained during the hydrogenation of gamma-pyrone and hydration of divinylketone. Dehydration of the 4-hydroxytetrahydropyran with  $\text{KHSO}_4$  produced 2,3-dihydro-alpha-pyran which in turn was hydrogenated into tetrahydropyran. Other cyclic alcohols - tetrahydropyran derivatives - obtained from the reaction of unsaturated alcohols with aldehydes, are listed. Six references: 3-USA; 2-USSR; 1-Scandinavian and 1-German (1918-1952).

Institution : The Technological Institute, Yaroslavl

Presented by: Academician I. N. Nazarov, July 5, 1954

FARBEROV, M.I.; TEPENITSYNA, Ye.P.; SHEMYAKINA, N.K.

Synthesis of oxytetrahydropyran and of the products of its conversions.  
(MIRA 8:4)  
Zhur.ob.khim.25 no.1:133-136 Ja '55.

1. Yaroslavskiy tekhnologicheskii institut i opytный zavod Ministerstva khimicheskoy promyshlennosti.  
(Pyran)

FARBETOV, M.I.

6500

Reaction of chloromethylene with formaldehyde. M. I. Farbetov and H. P. Ostavchikov (Technol. Inst., Farb-  
1951. Zhur. Obratn. Khim. 25, 2571-81 (1955). Gradual  
addn. of 450 ml.  $\text{CH}_2=\text{CHCl}$  to 300 g. paraformaldehyde,  
150 ml. concd.  $\text{H}_2\text{SO}_4$ , and 300 ml.  $(\text{CH}_3\text{CH}_2)_2\text{NH}$  and stirring 3  
hrs. at  $40^\circ$  gave after treatment with ice, extn. with  $(\text{CH}_3\text{CH}_2)_2\text{NH}$ , and washing th. ext. with  $\text{Na}_2\text{CO}_3$ , 60.5% 4-chloro-  
methyl-1,3-dioxane, b.  $83.5-9^\circ$ , d.  $1.3103$ , n.  $1.4552$ . This  
(255 g.) refluxed with 175 ml.  $\text{MeOH}$  and 18.5 g. concd.  
 $\text{H}_2\text{SO}_4$  with slow distn. of  $\text{MeOH}-\text{MeCH}(\text{OMe})$  azeotrope.  
gave 49.5% 8-hydroxy-1,3-dioxane, b.  $60-60.5^\circ$ , d.  
 $1.0910$ , n.  $1.4480$ , and 10.7 g. 4-chloro-1,3-bis(methyl)-  
1,3-dioxane (I), d.  $1.2260$ , n.  $1.4731$ . A similar reaction gave  
113.6-14.5°, d.  $1.2260$ , n.  $1.4731$ . A similar reaction gave  
in 4 hrs. at  $80^\circ$  from 95 g. paraformaldehyde, 300 ml.  
 $\text{CH}_2=\text{CHCl}$ , 100 ml.  $\text{H}_2\text{SO}_4$ , and 600 ml.  $\text{AcOH}$ , 20.6%  
4-chloromethyl-1,3-dioxane (I), and 29.1% 4-chloro-1,3-  
bis(methyl)-1,3-dioxane, b.  $107-8^\circ$ , d.  $1.1843$ , n.  $1.4489$ , which  
on methanolysis gave the 2 products listed above. I with  
 $\text{SOCl}_2$  in the presence of  $\text{ZnCl}_2$  gave 46.4% 2-chloromethyl-  
1,3-dioxane, b.  $93.5-7^\circ$ , d.  $1.3201$ , n.  $1.4950$ . Para-  
1,4-dichlorodioxane, b.  $93.5-7^\circ$ , d.  $1.3201$ , n.  $1.4950$ . Para-  
1,4-dichlorodioxane (cf. Atundale and Miketka, C.A. 47,  
3353) gave 18.5%  $\text{CH}_2=\text{CHCHO}$ , b.  $72-2.5^\circ$ , d.  $1.0634$ ,  
n.  $1.4341$  (2,4-dinitrophenylhydrazones, m.  $84^\circ$ ), and 20.7%  
vinylacetaldehyde, crude b.  $90-100^\circ$  (2,4-dinitrophenyl-  
hydrazones, m.  $164^\circ$ ). The reaction of 300 ml.  $\text{CH}_2=\text{CHCl}$ ,  
450 g.  $\text{ZnCl}_2$ , 200 ml. concd.  $\text{HCl}$ , and 150 g. para-  
formaldehyde (added gradually) gave in 3 hrs. at  $25^\circ$  with

(2)

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# Reaction of chloropropenes...

const. passage of dry HCl, 2% 3,3-dichloro-1-butanol (II),  
 $b_p$  60-2°,  $d_4$  1.2858,  $n_D^{20}$  1.4825 (3,5-dinitrobenzoate, with  
 $1-C_6H_4NH_2$ , m. 102°) and 58.4% of 60:40 mixt. of (Cl-  
 $CH_2CHCH_2CH_2OCH_3$ ,  $b_p$  164-7°,  $d_4$  1.2948,  $n_D^{20}$   
1.4833, and (ClCH<sub>2</sub>CHCH<sub>2</sub>CH<sub>2</sub>O),  $b_p$  151-2°,  $d_4$   
1.2829,  $n_D^{20}$  1.4904; methanolysis of this mixt. gave 3,4-  
dichlorobutanol and the above ether. Heating II with  
KHSO<sub>4</sub> gave 52.5% 3-chlorotetrahydrofuran,  $b_m$  129.1-9.3°,  
 $d_4$  1.1632,  $n_D^{20}$  1.4530, also formed from 3-hydroxytetra-  
hydrofuran and SOCl<sub>2</sub>. Treatment of II with SOCl<sub>2</sub>  
(excess) gave 1,2,3-trichlorobutane,  $b_p$  81-2.5°,  $d_4$  1.2175,  
 $n_D^{20}$  1.4820. Heating 13.5 g. this trichloride with 11 g.  
powd. NaOH to 100° gave a distillate contg. 1.5 g. CH<sub>3</sub>-  
CClCH:CH<sub>2</sub> and 3.1 g. 1,2-dichloro-3-butene. Reaction  
of 100 g. paraformaldehyde, 280 ml. 1-chloropropene, 100  
ml. concd. H<sub>2</sub>SO<sub>4</sub>, and 500 ml. AcOH gave in 3 hrs. at 80°  
25% 4-methyl-5-chloro-1,3-dioxane,  $b_p$  79-80°,  $d_4$  1.1934,  
 $n_D^{20}$  1.4611, 8.5% 3-chloro-1,3-butanediol diacetate,  $b_p$  92-4°,  
 $d_4$  1.1724,  $n_D^{20}$  1.4435, and 12.1 g. 1-chloro-2-propanol ace-  
tate,  $b_p$  43-4°,  $d_4$  1.1489,  $n_D^{20}$  1.4375. Methanolysis of  
the 2nd product gave a poor yield of 3-chloro-1,3-butanediol,  
 $b_p$  100-2°,  $d_4$  1.2406,  $n_D^{20}$  1.4700. Reaction of 115 g. para-  
formaldehyde, 250 ml. 1-chloropropene, 400 g. ZnCl<sub>2</sub>, and  
450 g. 100% H<sub>3</sub>PO<sub>4</sub> gave in 4 hrs. at 40° with const. pas-  
sage of dry HCl, 33.4 g. mixed 2,3-dichloro-1-butanol and  
4-methyl-5-chloro-1,3-dioxane,  $b_p$  70-6°, and 41.5% (1,6-  
CH<sub>2</sub>CHCH<sub>2</sub>CH<sub>2</sub>O)CH<sub>2</sub>Cl,  $b_p$  145-7°,  $d_4$  1.2703,  $n_D^{20}$  1.4790;  
which on methanolysis gave 57.5% 2,3-dichloro-1-butanol,  
 $b_m$  75-6°,  $d_4$  1.2697,  $n_D^{20}$  1.4731 (3,5-dinitrobenzoate with  
1-C<sub>6</sub>H<sub>4</sub>NH<sub>2</sub>, m. 93-100°). Addn. of 100 ml. 2-chloro-

2/3

# Reaction of chloropropenes...

propene to 50 g. paraformaldehyde in 30 ml. concd.  $H_2SO_4$  in 1.5 hrs. at  $19^\circ$  gave tar and 10.2%  $MeCHClCH_2CHO$ , bp  $60-7^\circ$ ,  $d_4^{20}$  1.0820,  $n_D^{20}$  1.4351 (2,4-dinitrophenylhydrazones, m.  $77-8^\circ$ ). Reaction of 150 g. paraformaldehyde, 300 ml. 2-chloropropene and 1 l. concd.  $HCl$  gave after 3 hrs. at  $45^\circ$  53%  $(MeCClCH_2CH_2O)CH_3$ , b.  $123-6^\circ$ ,  $d_4^{20}$  1.2575,  $n_D^{20}$  1.4760, 12.7%  $MeCHClCH_2CHO$ , and 2%  $MeCClCH_2CH_2OH$ , b.  $73-5^\circ$ ,  $d_4^{20}$  1.2309,  $n_D^{20}$  1.4550 (3,5-dinitrobenzoate with  $C_6H_5NH_2$ , m.  $105-6^\circ$ ); methanolysis of the formal gave the latter alc. in 68% yield. Heating 25 g.  $MeCClCH_2CH_2OH$  with pptd. chalk in aq. suspension 4 hrs. at  $180^\circ$  gave 27.4% 3-chloropropyl alc., b.  $64-6^\circ$ ,  $d_4^{20}$  1.1135,  $n_D^{20}$  1.4620. Reaction of 57.6 g. paraformaldehyde, 400 ml. concd.  $HCl$ , and 310 ml. propylene in 50 min. at room temp. gave 18.5% 4-methyl-1,5-dioxane, b.  $115.3^\circ$ ,  $d_4^{20}$  0.973,  $n_D^{20}$  1.4150, 4.3% 3-chloro-1-butanol, bp  $68^\circ$ ,  $d_4^{20}$  1.00416,  $n_D^{20}$  1.4428, and 33.3%  $(MeCHClCH_2CH_2O)CH_3$ , b.  $131.6^\circ$ ,  $d_4^{20}$  1.08076,  $n_D^{20}$  1.4490. Reaction of 1 g. paraformaldehyde with 3 ml.  $CH_3CHClCH_2Cl$  or 1-chloropropene, and 4 ml. concd.  $HCl$  was run in an ampul at  $80^\circ$  or  $90^\circ$ ; similar reactions with propylene and 2-chloropropene were run at  $25^\circ$  in autoclave. After varying time intervals the mixts. were analyzed for  $CH_2O$  content. These expts. indicate the following order of reactivity with formaldehyde and  $HCl$ : propylene > 2-chloropropene > allyl chloride > 1-chloropropene = 100:143:2:1.3. The above reactions are readily explainable on the basis of carbonium ion mechanism of acid-catalyzed addn.

G. M. K.

FARBEROV, M.I.

USSR/Chemical Technology - Chemical Products and Their  
Application. Industrial Organic Synthesis

I-14

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 13067

Author : Farberov M.I., Speranskaya V.A.

Title : Concentration of Dilute Solutions of Formaldehyde under  
Pressure

Orig Pub : Zh. prokl. khimii, 1955, 28, No 2, 222-226

Abstract : Study of concentration of dilute solutions of formaldehyde (I). Determined was the dependence of composition of vapor and liquid, of the system I - water, at different pressures. With increasing pressure, the curves showing the composition of liquid and vapor are greatly deflected from the diagonal, i.e., the concentration occurs more readily. This deviation is especially pronounced on change in pressure from 2 to 4 atmospheres absolute. With increase in pressure, the content of I in the azeotropic mixture increases. Optimal pressure for concentration

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USSR/Chemical Technology - Chemical Products and Their  
Application. Industrial Organic Synthesis

I-14

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 13067

of I is 3-4 atmospheres absolute. Presented is a graph which shows the correlation between the content of I in the azeotropic mixture and the pressure. Determined was the extent of decomposition of I, depending on the duration of heating of a 22% solution of I with shavings of Cu, Al, EYa-1T steel and steel-3 at 140°. Steel-3 accelerates substantially the decomposition of I according to the equation:  $2\text{CH}_2\text{O} + \text{H}_2\text{O} \rightarrow \text{HCOOH} + \text{CH}_3\text{OH}$ . Losses of I in the presence of Cu, Al and EYa-1T steel differ but slightly from losses on operation in glass vessels. The action of HCOOH cause strong corrosion of steel-3 and EYa-1t; Cu and Al are sufficient resistant to corrosion caused by dilute solutions of HCOCH.

Card 2/2

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FARBEROV, M. I.

USSR/Organic Chemistry - Synthetic Organic Chemistry, E-2

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61533

Author: Farberov, M. I., Tepenitsyna, Ye. P., Shchemyakina, N. K.

Institution: None

Title: Synthesis of Hydroxytetrahydropyran and the Products of Its Conversion

Original

Periodical: Zh. obshch. khimii, 1955, No 125, 133-136; Dokl AN SSSR, 1954, 99, No 5, 793-796

Abstract: Description of a new synthesis of some derivatives of tetrahydropyran. Reaction of allyl carbinol (I) with  $\text{CH}_2\text{O}$  gives 4-hydroxy-tetrahydropyran (II) which is oxidized to tetrahydro- $\gamma$ -pyrone (III). By Beckmann's rearrangement of the oxime of III (IV) was prepared the lactam of  $\beta$ -ethoxypropionic acid (V). Attempts to polymerize V were unsuccessful. By dehydration of II with  $\text{KHSO}_4$  was prepared 2,3-dihydro- $\alpha$ -pyran (VI) which was hydrogenated to tetrahydropyran (VII). It is assumed that the primary product of reaction in the

Card 1/3



USSR/Organic Chemistry - Synthetic Organic Chemistry, E-2

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61533

Abstract: synthesis of II is pentatriol-1,3,5, which in the presence of acids undergo ring-closure to II. Mixture of 72 g I, 73 ml 40% solution  $\text{CH}_2\text{O}$  and 2.2 ml  $\text{H}_2\text{SO}_4$  (d 1.82) heated 3 hours, neutralized solution distilled to get II, yield 74.8%, BP  $190^\circ/760$  mm,  $n_D^{20}$  1.4612,  $d_4^{20}$  1.0708; dibenzoate MP  $155.5-160^\circ$  (from alcohol). Oxidation of 177 g II with solution of 360 g  $\text{K}_2\text{Cr}_2\text{O}_7$  in 200 ml  $\text{H}_2\text{SO}_4$  (d 1.81) and 1,500 ml water (6 hours, temperature  $<30^\circ$ ) and III is extracted with dichlorethane; yield 26.8%, BP  $67-68^\circ/18$  mm,  $n_D^{20}$  1.4510,  $d_4^{20}$  1.0844; 2,4-dinitrophenylhydrazones, MP  $186.5-187^\circ$  (from alcohol). 40 g III and 35 g  $\text{NH}_4\text{OH}\cdot\text{HCl}$  in mixture of 60 ml alcohol and 320 ml water heated to  $75^\circ$  stirred 24 hours and from neutralized solution IV extracted with ether; yield 100%, BP  $99-100^\circ/6$  mm, MP  $55^\circ$ . Heated mixture 70 g II with 70 g  $\text{KHSO}_4$ , driving off azeotropic mixture of VI and water boiling at  $78-80^\circ$  and separate VI, yield 57.2% BP  $93^\circ/760$  mm,  $n_D^{20}$  1.4480,  $d_4^{20}$  0.9394. By hydrogenation of 20.2 g VI over 2 g 5% Pd/C prepared VII, yield 100%, BP  $87.5^\circ/764$  mm,  $n_D^{20}$  1.4205,  $d_4^{20}$  0.8853. Into solution of 11.5 g IV in 100 ml 5N solution NaOH added at  $100^\circ$  19 g p-toluene-sulfochloride and extract with  $\text{CHCl}_3$

Card 2/3

USSR/Organic Chemistry - Synthetic Organic Chemistry, E-2

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61533

Abstract: the V, yield 20%, BP 165°/15 mm. V also prepared by interaction of 25 g IV in 50 ml  $C_2H_4Cl_2$  with 18 ml 25% oleum, yield 30%.

Card 3/3

<sup>15</sup>  
~~The use of Yarrezin A and Yarrezin B resins to increase~~  
~~the adhesiveness of synthetic rubber mixes. V. G. Ensh-~~  
~~tein, A. G. Belorossaya, and M. I. Farberov (Sverdlovsk~~  
~~Inst. Tech. and Tire Plant, Yaroslavl) Kautsch. Gummi~~  
~~1956, 329-33. The synthetic rubber mixes to which the 2~~  
~~alkylphenol-aldehyde resins, Yarrezin A and Yarrezin B,~~  
~~were added were sufficiently adhesive, and could be used~~  
~~in automobile tire manuf. without the use of other plastic-~~  
~~izers. Unlike other plasticizers, their addn. does not in-~~  
~~crease the tackiness of the finished products, nor reduce their~~  
~~mech. strength, while improving bonding between the plys.~~  
~~Yarrezin A was found preferable in butadiene-styrene rub-~~  
~~ber, Yarrezin B with sodium-butadiene rubber, and they~~  
~~were used in a concn. of 3-5 parts/100 parts by wt. of the~~  
~~rubber.~~  
W. M. Sternberg

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Math

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1291. Alkyl phenol aldehyde resins of various  
structures as tackifiers for synthetic rubbers. A. G. *Belanovskaya*, M. I. *Parshakov* and V. G. *Esentkin*.  
Uch. Zap. Yaroslavl. Tekh. Inst., 1956, 1, 85;  
Kauch. i Rezina, 1957, No. 1, 47. 286244516

CM  
MTT



USSR/Organic Chemistry. *FARBEROV, M.I.* Synthetic Organic Chemistry. E-2

Abs Jour : Ref Zhur - Khimiya, No. 8, 1957, 26690.

Author : Farberov, M.I.; Shemyakina, N.K.

Inst :  
Title : Hydrolysis of Alkyldioxanes.

Orig Pub : Zh. obshch. khimii, 1956, 26, No. 10, 2749 - 2754.

Abstract : The hydrolysis of the following was studied:  
of 4-methyldioxane-1,3 (I), 4,5-dimethyl-  
dioxane-1,3 (II), 4,4-dimethyldioxane-1,3  
(III) and 2,4,4,6-tetramethyldioxane-1,3  
(IV), all in presence of 1 to 5% of 92%-ual  
H<sub>2</sub>SO<sub>4</sub> and 3 to 5 mols of CH<sub>3</sub>OH (for binding  
the separating CH<sub>2</sub>O as methylal (V)). Butane-  
diol-1,3 (VI) was received from I, and 2-methyl-  
butanediol-1,3 was received from (VII). III  
was hydrolyzing with the formation of ...

Card 1/3

*Information received from ...  
hydrolysis of ...*

USSR/Organic Chemistry. Synthetic Organic Chemistry. E-2

Abs Jour :. Ref Zhur - Khimiya, No. 8, 1957, 26690.

3-methylbutanediol-1,3 (VIII), 3-methyl-3-methoxybutanol-1 (IX), isoprene and 3-methylbutene-2-ol-1. IV yielded a mixture of 2-methylpentadiol-2,4 (X), 4-methyl-4-metoksy-pentanol-2 (XI), 2-methylpentadiene-1,3 and 4-methyl-pentene-3-ol-2. V or acetal (at the reaction with IV) is slowly distilled off from the mixture of alkylidioxanes,  $\text{CH}_3\text{OH}$  and  $\text{H}_2\text{SO}_4$ , the residue is neutralized and distilled. The products of the reaction, the yield in %, the

boiling point in  $^{\circ}\text{C}/\text{mm}$ ,  $n_D^{20}$ ,  $d_4^{20}$  are enumerated:

VI - 82, 92/3, 1.4420, 1.0027; VII - 80, 92/6, 1.4478, 0.9919; VIII - 38.7, 95/7, 1.4420, 0.9763; IX - 27.7, 63/7, 1.4272, 0.9220; X - 18.2, 101/9, 1.4280, 0.9311;

Card 2/3

PAK RDL, M.I.

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 1  
 Dual reactivity in the reaction of olefins with aldehydes  
 M. J. Rucheyev (Technol. Inst., Voroslay) Doklady  
 Akad. Nauk S.S.S.R. 116, 1145, 8(1959). Heating approp-  
 riately olefins with  $\text{CH}_3\text{O}$  or  $\text{AcH}$  in aq. soln. in an autoclave  
 with 1-5%  $\text{H}_2\text{SO}_4$  at 85-115° at 40-50 atm. pressure for  
 $\text{C}_4\text{H}_8$  + 8-14 atm. for butylenes resulted in isolation of the  
 following products, indicative of reactions typical of 1,2-  
 or 1,4-additions of the aldehyde to the alkene.  $\text{C}_4\text{H}_8$  and  
 $\text{CH}_3\text{O}$  gave 3-5% 1,3-butanediol and 80-5% 4-methyl-1,3-  
 dioxane, with 0.4-0.6% allylcarbinol and 7-8% 4-hydroxy-  
 tetrahydropyran; 2-butene and  $\text{CH}_3\text{O}$  gave 90-2% 4,5-  
 dimethyl-1,3-dioxane and 7-8% 3-methyl-4-hydroxypyran;  
 isobutylene and  $\text{AcH}$  gave 88-92% 2,4,4,6-tetramethyl-  
 1,3-dioxane and 3-5% 2,4,6-trimethyl-4-hydroxytetra-  
 hydropyran; isobutylene and  $\text{CH}_3\text{O}$  gave 7-10% 2-methyl-  
 1,3-butanediol, 73-80% 4,4-dimethyldioxane, 7-8% 5-  
 methyl-6,6-dimethyl-1,3-dioxane, bp 115-10°,  $d_4^{20}$  1.0905,  
 $n_D^{20}$  1.4644, and some  $\text{HOCH}_2\text{CH}(\text{CH}_3)_2$ , b, 150°,  
 $n_D^{20}$  1.4755.  
 G. M. Koshlakov

RM att



FARBEROV, M. I.

Methylenecyclopentadiene, M. I. Farberov and S. I. Kuvshinov, U.S.S.R. 136,677, Aug. 20, 1967. Propylene is converted into 2-methyl-1-pentene by selective dimerization and then into the diene by dehydrogenation.

M. Hesch

1/1 4  
1-4E4  
1-4E30  
1-4E20  
2-methyl

London, 11. 11. 1891.

~~Propylene Isotamer. M. I. Harkovskiy, S. I. Kuznetsov, A. M. Kuznetsov, and A. M. Kuznetsov. USSR 167,111, Aug. 25, 1968. First the dimer is obtained by selective isomerization of the monomer in the presence of a catalyst. The dimer is then polymerized to form a polymer. The polymer is then used as a catalyst.~~

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SOV/81-59-5-16377

53200

Translation from: Referativnyy zhurnal, Khimiya, 1959, Nr 5, p 376 (USSR)

AUTHORS: Bondarenko, A.V., Bogdanov, M.N., Farberov, M.I.

TITLE: The Industrial Synthesis of Vinyl Toluene <sup>1</sup>

PERIODICAL: Uch. zap. Yaroslavsk. tekhnol. in-ta, 1957, Vol 2, pp 33 - 46

ABSTRACT: The process of catalytic dehydrogenation of ethyl toluene (I) to vinyl toluene (II) was investigated at 540 to 600°C with a volumetric rate of 200 - 800 ml per 1 liter of the catalyst per hour and with dilution by H<sub>2</sub>O vapors in the molar ratio of 1:8 - 1:16. With an increase in the temperature to > 580°C and a drop in the volumetric rate to < 400, the yield of II is reduced considerably. The optimum conditions of the dehydrogenation process are: temperature 560 - 580°C, volumetric rate 400 - 800 ml per 1 liter of catalyst per hour, dilution with H<sub>2</sub>O vapors 1:12 - 1:16. The standard catalyst for dehydrogenation K<sub>2</sub>12 was used as catalyst. A thermodynamic calculation of the dehydrogenation reaction was made. The equilibrium constants and the equilibrium composition were computed at 427 - 727°C, and also

Card 1/2

The Industrial Synthesis of Vinyl Toluene

30627

SOV/81-59-5-16377

the apparent energy of activation of the dehydrogenation reaction, being 32,700 cal on the average. It is shown that, in addition to I and II, toluene, xylene, ethyl benzene and styrene are part of the catalysate composition. A circuit diagram of the contact installation is submitted. H

L. Volkova

Card 2/2

7. The following are the results of the investigation:

TH

1. PARBEROV, M. I.

7-11-1957

AUTHORS: Parberov, M. I., MacLennan, K. A.

TITLE: Synthesis of Methylpentadiene by Means of Isobutylene and Acetic Aldehyde (Sintez metilpentadiyena na osnove izobutilena i atsetal' degida)

PERIODICAL: Zhurnal Obshchey Khimii, 1957, Vol. 27, Nr 11, pp.3001-3005 (USSR)

ABSTRACT: Methylpentadiene is commercially little accessible. The method where methylpentadiene is obtained from acetone over a number of stages of development seems to be the only method of a certain industrial importance. But industry has a certain interest in this product, as its polymers and copolymers are characterized by a number of valuable properties. In the present paper it is shown that methylpentadiene with a 75 % yield, calculated on the basis of decomposed tetramethyldioxane, is obtained on passage of alkyl-dioxane together with water-vapors at 300 - 325° C over a phosphate-catalyst. It is possible that two isomeric dienes, 2-methylpentadiene-1,3 and 4-methylpentadiene-1,3 whose properties are little different, form in the contact-decomposition. The quantitative determination of the mixture of isomers is based on the different behavior toward the maleic acid anhydride, where the presence of an inhibitor causes a complete separation of the isomers (45 - 55%).

Card 1/2

75-11-19/56

Synthesis of Methylpentadiene by Means of Isobutylene and Acetic Aldehyde

Thus a mixture of isomers of methylpentadiene with a 75 % yield was obtained in the contact-decomposition of 2,4,4,6-tetramethyldioxane. Beside the dienes some isomers of the methylpentenols were produced. A reaction mechanism is suggested. There are 3 figures, 1 table, and 10 references, 5 of which are Slavic.

ASSOCIATION: Yaroslavl' Technological Institute  
(Yaroslavskiy tekhnologicheskiiy institut)

SUBMITTED: November 15, 1956

AVAILABLE: Library of Congress

1. Methylpentadiene-Synthesis
2. Diene synthesis
3. Isobutylene-Chemical reactions
4. Acetic aldehyde-Chemical reactions
5. Tetramethyldioxane-Decomposition

Card 2/2

FARBEROV, M.I.

Alkylation of toluene with ethylene. A. V. Bondarenko, M. I. Farberov, and M. I. Farberov (Technol. Inst. Yuzhnyy Zhur. Priklad. Khim. 33, 781-6 (1957)). Alkylation of PhMe with  $C_2H_4$  was studied under the following optimum conditions detd. by a series of preliminary expts. a stirrer rate of 1200 r.p.m. at  $85^\circ$  with 5-6% of anhyd.  $Al_2Cl_3$  and an 10-15% excess of  $C_2H_4$ . The products were sepd. by fractionation (33 theoretical plates) in 3 fractions: PhMe, b.  $102-105^\circ$ , ethyltoluene, b.  $156-65^\circ$ , and polyethyltoluene above  $165^\circ$ . The rate of  $C_2H_4$  absorption  $V_{av}$ , moles  $C_2H_4$ /moles PhMe, increased hyperbolically with the molar ratio  $x$   $Al_2Cl_3$ /PhMe so that  $V_{av}$  was directly proportional to  $\sqrt{x}$ , up to  $x = 0.3$ . The heat value of  $x$  was 0.5-0.6. The temp. coeff. in the  $75-85^\circ$  range was 1.45. The 3rd fraction contained about 70% *cr*- and 30% *p*-isomers.

I. Bencowitz



*Farberov, M. I.*

Dehydrogenation of ethyltoluene to vinyltoluene. A. V. Soudarenko, M. I. Bogdanov, and M. I. Farberov (Technol. Inst. Vorosilov). Zhur. Priklad. Khim. 30, 927-32 (1957); cf. C.A. 51, 17782b.—When  $\text{MeC}_6\text{H}_4\text{Et}$  (I) dild. with steam was passed over  $\text{ZnO}$  at  $340-400^\circ$ , the yield of vinyltoluene (II) decreased with the temp. and increased with the rate of passage of I and the dild. The optimum conditions were a rate of  $400-800$  ml. I/l. catalyst/hr. at  $560-80^\circ$  with a  $1/11-1/16$  dild. giving a yield of II up to 89.6% based on reacted I (35.3% based on I passed over the catalyst). Under the optimum exptl. conditions mixts. of I with 40.5% II were stable without the catalyst; only 2% decompd. In the presence of  $\text{ZnO}$ , 8.4% decompd. and with richer mixts., contg. 78% II, 25% decompd. The apparent energy of activation, calcd. by Arrhenius' equation, is 32,700 cal./mol.

I. Reingold

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1-4B2d  
1-4B4f  
1-4E2c  
2-MAY

11/12

5(1) PAGE 1 OF 1 DEPARTAMENT 809/2827

Yakovlev, Technological Institute

Klavayev, Scientific Notes, Vol. 1

Thermodynamic Properties of Chemical Compounds

Material Data: A.I. Zakharov, Candidate of Chemical Sciences; Doctor of Technical Sciences; Professor N.I. Pavlov, Doctor of Technical Sciences

Prof. M.I. Professor Yu.S. Maslov, Doctor of Chemical Sciences

Secretary-Scientist: B.F. Detshevskiy, Candidate of Chemical Sciences

REMARKS: This book is primarily intended for industrial chemists and technical scientists interested in the kinetics of chemical reactions and their related physical processes.

CONTENTS: The twenty-two articles of this collection deal mainly with industrial processes for the preparation of organic compounds, problems of heat physics and general problems related to these processes, and with industrial chemical equipment. No preface is given, and with are given after each article.

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B-GLROSSOW, A.G.; WARBROV, I.I.

Synthesis of alkylphenols. Uch.zap. Kirovsk. tekhnol. inst. 2:19-32  
197. (Phenols) (Alkylation) (KIRA 12:7)

BONDARENKO, A.V.; BOGDANOV, M.I.; FARBEROV, M.I.

Industrial synthesis of vinyltoluene. Uch.zap.IArosl.tekhnol.inst.  
2:33-46 '57. (MIRA 12:7)  
(Chemistry, Technical) (Styrene)

**AUTHORS:** Farberov, M. I., Machtina, K. A., Kryukov, S.I., 20-114-4-35/63

**TITLE:** Two Methods for a Commercial Scale Production of Methylpentadiene (Dva metoda tekhnicheskogo sinteza metilpentadiyena)

**PERIODICAL:** Doklady Akademii Nauk SSSR, 1957, Vol. 114, Nr 4, pp. 807-810 (USSR)

**ABSTRACT:** Hitherto methylpentadiene is a commercially little accessible diene. The only method of some technical value was proposed by American authors and produces methylpentadiene from acetone. Because of the properties of its polymers and co-polymers methylpentadiene is of a certain interest. The present paper describes two methods of its technical synthesis. 1.) The authors thoroughly investigated the interaction reactions of olefines with aldehydes. Thus the chief reaction product from the interaction of isobutylene and acetaldehyde in the presence of 1-2% sulphuric acid is 2,4,4,6-tetramethyldioxane-1,3 (denoted TMD/I/ in the following; 90% yield of the aldehyde reacted through). Published works report that the alkyldioxanes-1,3 may be serve as initial substances for the dienesynthesis. The authors' experiments proved that by the passage of TMD with vapor over a ca-

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**Two Methods for a Commercial Scale Production of Methylpentadiene**

26-114-4-35/63

talyst, metapentadiene with a 75% mol. yield of the decomposed TMD/I/ is obtained. On this occasion two isomeric dienes develop: 2-methylpentadiene-1,3/II/ and 4-methylpentadiene-1,3/III/. Their physical properties are very similar. Their quantitative determination in the mixture is based upon their different behaviour towards maleic anhydride: II gives an adduct, III a co-polymer. In the presence of inhibitors the polymerization inclination of III may be suppressed, so that it can be separated from II. II and III were obtained in the proportion 45:55. Beside methylpentadiene a small amount (3%) of a mixture of two isomeric methylene pentanols (IV and V) results from contact cracking. There occurs also a cracking reaction of I, giving the original substances: acetaldehyde and isobutylene. A diagram of contact cracking of TMD/I/ in time is given in the paper. The water apparently participates in the reaction and favours the hydrolysis of I into an intermediate diol on the surface of the catalyst. In the moment of its formation VI dehydration under liberation of one or two water molecules and under according formation of a mixture of two isomeric methylpentanols IV,V or dienes II,III. 2) The second technical method of methylpentadiene synthesis is the dehydration of the

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Two Methods for a Commercial Scale Production of Methylpentadiene

20-114-4-35/63

propylene-dimer: 2-methylpentene-1/VII/. The experiments with catalytic dehydration of VII show that methylpentadiene can be produced in this manner. Here, too a mixture of the isomers II and III is obtained in about the same amounts and with a yield of 35-38% of the VII sent through and 70-75% of the VII decomposed. There are 2 figures, 2 tables, and 11 references, 4 of which are Soviet.

ASSOCIATION: Yaroslavl' Technological Institute (Yaroslavskiy tekhnologicheskii institut)

PRESENTED: January 15, 1957 by I. N. Nazarov, Member, Academy of Sciences, USSR

SUBMITTED: November 14, 1956

Card 3/3

AUTHORS: Kryukov, S. I., Kut'in, A. M., Levskaia, G. S., 153-58-1-13/29  
Tepenitsyna, Ye. P., Ustavshchikova, Z. F., Farberov, M. I.

TITLE: An Improved Method of the Synthesis of Triethyl-Aluminum  
(Uluchshennyi sposob sinteza trietilal'yuminiya)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy,  
Khimiya i khimicheskaya tekhnologiya, 1958, Nr 1,  
pp. 86-93 (USSR)

ABSTRACT: The authors give a survey on the publications of trialkyl-  
aluminum as specific catalyst, both alone, as well as with  
cocatalysts for olefinic polymerization (references 1 to 3),  
and they compare with each other the known methods of  
production of aluminum-organic compounds (references 4 to 6).  
The authors selected the method by Grosse and Meviti  
(Mavity, ref. 5) as the most convenient one. A) - Production  
of ethylaluminum sesquichloride (mixture of ethylaluminum-  
dichloride and diethyl-aluminum-chloride). The first stage  
of the process according to reference 5 proved to be rather  
incomplete. It is difficult to be controlled, has a long  
period of induction and often leads to the complete  
destruction of the products, sometimes with explosion. The

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## An Improved Method of the Synthesis of Triethyl-Aluminum

153-58-1-13/29

authors tried various initiators at atmospheric pressure (crystalline iodine, ethylaluminum-sesquichloride, ethylbromide and a mixture of these substances). Table 1 shows the influence of individual initiators on the period of reaction. Ethylbromide acted most efficiently. Table 2 shows the influence of the initial temperature with the supply of ethylchloride on the reaction-period. Optimum conditions for the carrying out of the process were selected from the obtained test results. Further tests were carried out on an enlarged plant (figure 1). The laboratory results were confirmed: It was possible to reduce the reaction-period to from 2 to 3 hours. B)- Reaction of symmetrization of ethylaluminum-sesquichloride. In order to obtain triethylaluminum, the above reaction must be carried out with the participation of metallic sodium. According to reference 5, various insufficiencies exercised a disturbing effect in this connection. The authors found the conditions for removing them: 1)- Sodium ought to be used in fine dispersion, the surplus of Na must not exceed 5 to 10% of the theoretically required quantity. 2) - Sesquichloride must be introduced in portions as a 20 to 30% solution in hydrocarbons. 3) - The temperature of reaction must not

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An Improved Method of the Synthesis of Triethyl-Aluminum .153-58-1-13/29

exceed  $130^{\circ}$  and an intense agitation should be guaranteed. The gasoline-fraction "galosha" (boiling above  $100^{\circ}$ ) proved most effective among several tested solvents. The yield of triethylaluminum amounted to 70 to 76% of the charged sesquichloride under the selected optimal conditions. A certain quantity of partly oxidized triethylaluminum was proved in the produced triethylaluminum. The inactive part of the catalyst formed a mixture of all 3 possible ethoxy-compounds. An experimental part follows. C) - Production of aluminum sesquichloride. According to the method described here, a 99% yield of that theoretically possible was obtained. The two (paragraph A) components were present in the mixture in approximately equimolar quantities. D) - The reaction of symmetrization was carried out in a device shown in figure 3. A filter required for this purpose is shown in figure 4. There are 4 figures, 2 tables, and 12 references, 3 of which are Soviet.

ASSOCIATION: Yaroslavskiy tekhnologicheskii institut i opytiny zavod  
Card 3/4 Ministerstva khimicheskoy promyshlennosti. Kafedra

An Improved Method of the Synthesis of Triethyl-Aluminum 153-58-1-13/29

tekhnologii osnovnogo organicheskogo sinteza i SK  
(Yaroslavl Technological Institute and  
the Experimental Plant of the Ministry for Chemical Industry.  
Chair for the Technology of General Organic Synthesis  
and SK)

SUBMITTED: September 23, 1957

Card 4/4

AUTHORS: Farbarov, M. I., Kut'in, A. M.,  
Vernova, T. P., Shemyakina, N. K.

SOV/156 -58-1-36/46

TITLE: Industrial Synthesis of Allylcarbinol and Standard Butyl Alcohol on the Basis of Propylene and Formaldehyde (Tekhnicheskii sintez allilkarbinola i normal'nogo butilovogo spirta na osnove propilena i formal'degida)

PERIODICAL: Nauchnyye doklady vysshey shkoly, Khimiya i khimicheskaya tekhnologiya, 1958, Nr 1, pp. 148 - 152 (USSR)

ABSTRACT: In their laboratory the authors have for years studied syntheses based on olefine and formaldehyde (Refs 1,2). Allyl dioxanes-1,3 are converted into dienes. Catalysts and conditions were developed by means of which 80 - 90% of the theoretically possible diene yield could be obtained (Ref 2). By passing it over a catalyst in the presence of water vapor, 4-methyl dioxane-1,3 can be easily converted into divinyl. As further investigations have shown, the allylcarbinol yield can be substantially increased by carrying out the contact process under less severe conditions (lower temperatures, shorter contact time; Fig 1). Figure 2 shows the influence of temperature upon the allylcarbinol yield, given in molar per cent

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Industrial Synthesis of Allylcarbinol and Standard  
Butyl Alcohol on the Basis of Propylene and Formaldehyde

SOV 156-58-1-36/46

related to methyl dioxane. Table 1 shows the results of a typical balance experiment; under such conditions as were chosen here, the weight ratio of the allylcarbinol and divinyl yields, related to the decomposed methyl dioxane, may be even a little greater than unity. The author's idea about the mechanism of this reaction is as follows: The catalyst (a calcium phosphate mixture) possesses hydrolyzing and at the same time dehydration properties (Ref 9). With the same catalyst, and under the same conditions, trimethyl carbinol is dehydrated to isobutylene with a quantitative yield. The 1. reaction stage is therefore the hydrolysis of methyl dioxane (I) in the presence of water vapor to butandiol-1,3 (II), with separation of formaldehyde. Butandiol is further dehydrated, being converted to allylcarbinol (III) and divinyl (IV). Propylene is formed in small quantities due to a cracking reaction. Allylcarbinol may itself be of interest as a starting material for syntheses. From an industrial viewpoint, however, its use in hydration in standard butyl alcohol is of greater importance. There are 3 figures, 2 tables, and 13 references, 8 of which are Soviet.

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Industrial Synthesis of Allylcarbinol and Standard SOV/156-58-1-36/46  
Butyl Alcohol on the Basis of Propylene and Formaldehyde

ASSOCIATION: Kafedra tekhnologii osnovnogo organicheskogo sinteza i SK  
Yaroslavskogo tekhnologicheskogo instituta (Chair of  
Technology of Basic Organic Synthesis and Sk of the Yaroslavl'  
Institute of Technology)

SUBMITTED: October 3, 1957

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82147

SOV/81-59-6-20403

Translation from: Referativnyy zhurnal. Khimiya, 1959, Nr 6, pp 384-385 (USSR)

53831

AUTHORS: Farberov, M.I., Ustavshchikov, B.F., Kut'in, A.M., Vernova, T.P.,  
Yarosh, Ye.V.

TITLE: The Methods of Technical Synthesis and the Application of 2-Methyl-5-Ethylpyridine and 2-Methyl-5-Vinylpyridine

PERIODICAL: Yaroslavl'sk. prom-st' (Sovnarkhoz Yaroslavl'sk. ekon. adm. r-na), 1958, Nr 3, pp 15 - 21

ABSTRACT: In the condensation of 1 mole of paraldehyde and 4 moles of 40-60% (better 50%) aqueous solution of  $\text{NH}_3$  in the presence of a catalyst (organic or inorganic salt) taken in the quantity of 1-2% based on the weight of the paraldehyde (20-30 min, 260°C, pressure 80-100 atm) 99% pure 2-methyl-5-ethylpyridine<sup>1</sup>(-) is obtained, yield 75-80%, b. p. 176.7°C,  $n_D^{20}$  1.4974,  $d_4^{20}$  0.9189; as impurities  $\alpha$ - and  $\beta$ -picoline, higher pyridines and resins are formed. The reaction proceeds in the following order:  $4\text{CH}_3\text{CHO} + \text{NH}_3 \rightarrow \text{N}=\text{C}(\text{CH}_3)\text{CH}=\text{CHC}(\text{C}_2\text{H}_5)=\text{CH} + 4\text{H}_2\text{O}$ . I, diluted by water steam in the molar ratio 1:12-1:20 is dehydrogenated in the presence of industrial dehydrogenation catalysts<sup>1</sup>(K-10 and K-12) consisting of Zn, Cr, Fe and Al oxides activated by  $\text{K}_2\text{O}$  for 2

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SOV/81-59-6-20403

The Methods of Technical Synthesis and the Application of 2-Methyl-5-Ethylpyridine and 2-Methyl-5-Vinylpyridine

hours at 575-600°C and a volumetric rate of 500-600 ml per 1 l of catalyst in 1 hour, 97-99% pure 2-methyl-5-vinylpyridine (II) is obtained, yield 20-25% based on I having passed through, or 70-75% based on I decomposed, b. p. 75°C/15 mm,  $n_D^{20}$  1.5454,  $d_4^{20}$  0.9579. The content of II in the catalyzate is 23-27%, the yield of the catalyzate 89-91%. Pyridine, picolines, 2,5-dimethyl-, 3-ethyl- and 3-vinylpyridine are formed as impurities. II is very inclined to polymerization. S,  $C_6H_2(OH)(NO_2)_3$ ,  $\alpha$ -nitroso- $\beta$ -naphthol and methol (sulfate salt of methylaminophenol) are used as stabilizers of II. In the process of II separation S is used as stabilizer and methol for storing (in concentrations of up to 0.001 weight %). In the case of oxidizing I by  $KMnO_4$  or  $Cu(NO_3)_2$ , 2,5-pyridine-carboxylic acid (yield 60-70%, m. p. 236°C) is obtained which is converted to nicotinic acid by decarboxylizing with a yield of ~100% (m. p. 163°C). The dimethyl ester of 2,5-pyridine-dicarboxylic acid (m. p. 163°C) after reesterification by ethyleneglycol is condensed in the presence of  $ZnCl_2$  into a high-polymeric resin. I with  $CH_2O$  forms 5-ethyl-2-vinyl- and 5-ethyl-2-( $\beta$ -oxyethyl)-pyridine with a high yield. I is easily hydrogenated with a yield of ~100% by Na in butyl alcohol.

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SOV/81-59-6-20403

The Methods of Technical Synthesis and the Application of 2-Methyl-5-Ethylpyridine and 2-Methyl-5-Vinylpyridine

and also catalytically (in the presence of Ni-catalysts) in 2-methyl-5-ethyl-piperidine, b. p. 160-161°C,  $n_D^{20}$  1.4530,  $d_4^{20}$  0.8559. It is a monomer for the industry of synthetic rubber, it can be used in the production of plastics and synthetic fibers.

Ya. Danyushevskiy

Card 3/3

5(1,3)

AUTHORS:

Prokof'yev, Ya. N., Epshteyn, V. G.,  
Farberov, M. I.

SCV/193-58-4-21/22

TITLE:

Styrene Butadiene Resins as Reinforcing Additions to  
Rubbers, and the Possible Reinforcing Mechanism (Stirol'no-  
butadiyenovyye smoly kak usilivayushchiye ingredienty  
dlya kauchukov i vozmozhnyy mekhanizm usileniya)

PERIODICAL:

Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimiches-  
kaya tekhnologiya, 1958, Nr 4, pp 128 - 137 (USSR)

ABSTRACT:

Styrene butadiene resins are copolymers of styrene  
and butadiene, with styrene prevailing. They form a new  
class of the reinforcing agents of rubber mixtures.  
Abroad they are used as floor covering (linoleum sub-  
stitute), rubber linings, electric insulation, ebonite  
etc. (Refs 1-3). A further use of these resins is that  
of main additions in high-quality shoe soles made of one  
piece, heels, and other products of synthetic leather  
(Refs 2-8). The properties of the resins depend on  
the ratio styrene: butadiene in the polymerization. A

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Styrene Butadiene Resins as Reinforcing Additions to  
Rubbers, and the Possible Reinforcing Mechanism

SCV/153-58-4-21/22

higher quantity of styrene increases the specific weight, the tensile strength, and decreases the relative expansion (Ref 8). The vulcanizates to which the resins in question are added become stronger, harder, higher resistant to friction and to repeated deformations. All these properties connected with the low specific weight and the dyeability in any shade open great possibilities for these styrene butadiene resins in the imitation leather industry. In the experimental part, the production method (Refs 10-11) as well as polymerization recipe are mentioned (Table 1). The characterization of the resins in dependence on the styrene content is given in table 2. Based on their investigations the authors arrived at the following conclusions: 1) The styrene butadiene resins are the best for reinforcing vulcanizates of styrene and nitril rubber; those of natural and sodium butadiene rubber are reinforced to a smaller extent. 2) With respect to several properties the said resins have the same effect as the

Card 2/4

Styrene Butadiene Resins as Reinforcing Additions to Rubbers, and the Possible Reinforcing Mechanism

SOV/153-58-4-21/22

addition of active soot. They are better than soot with respect to the increase of the resistance to repeated deformation. This is of great importance in using these resins for the production of shoe soles and imitation leather. 3) The reinforcing by styrene butadiene resins is higher if they are added in the latex stage of the rubber. This difference in the physical and mechanical properties of the vulcanizates is greater the higher the content of the bound styrene in the resin is (if added in the latex stage and on the rolls). Resins containing 85-95% styrene have the best effect. Resins having less than 70% styrene do not cause any noticeable reinforcement. 5) The cause of the reinforcing effect probably is the intermolecular interaction of resins and rubbers. A high resistance to tearing and abrasion can be explained by a fibrous structure formed by complexes of rigid, expanded resin molecules; these molecules are arranged between the flexible rubber agglomerates. There are 6 figures, 5 tables, and 22 references, 10 of which are Soviet.

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Styrene Butadiene Resins as Reinforcing Additions to  
Rubbers, and the Possible Reinforcing Mechanism

SC7/153-50-4-21/22

ASSOCIATION: Yaroslavskiy tekhnologicheskii institut i opytnyy zavod  
Ministerstva khimicheskoy promyshlennosti (Yaroslavskiy  
Technological Institute and Experimental Plant of the  
Ministry of Chemical Industry) Kafedra tekhnologii  
osnovnogo organicheskogo sinteza i SK (Chair of Organic  
Basic Synthesis and Synthetic Rubber)

SUBMITTED: October 26, 1957

Card 4/4

AUTHORS: Tepenitsyna, Ye. P., Farberov, M. I. SOV. 1958-4-40/49

TITLE: The Determination of the Activity of Trialkyl Aluminum in the Reaction of Stereoregular Polymerization (Opredeleniye aktivnosti trialkilal'yuminiya v reaktsiyakh stereoregulyarnoy polimerizatsii)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 4, pp 765-767 (USSR)

ABSTRACT: A new method of determining the activity of trialkyl aluminum in the reactions of the stereoregular polymerization was described. The method is based on the capability of the  $AlR_3$  to reduce titanium tetrachloride quantitatively into titanium-(III)-chloride under special working conditions. The dependence of the degree of reduction  $Ti^{4+}$  upon the molar ratio  $AlR_3 : TiCl_4$  at  $20^\circ C$  was investigated. In the ratio 1 the reduction occurs to trivalent titanium and in the ratio higher than 1 bivalent titanium is formed. The method suggested was compared with the quinoline method developed by Bonits (Bonits) and it was ascertained that the results of both methods are equal to each other. The calculation of the active  $Al_{act}$  is

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SOV 11.6-18-4-40/49

The Determination of the Activity of Trialkyl Aluminum in the Reaction of Stereoregular Polymerization

carried out according to the following formula:

$$Al_{act.} = \frac{V_{KMnO_4} \cdot F_{KMnO_4} \cdot 0.0027}{V_{AlR_3}} \text{ g/ml}$$

$V_{KMnO_4}$  - ml 0.1 n  $KMnO_4$  - consumption in the titration;

$F_{KMnO_4}$  - factor of the  $KMnO_4$  solution; 0.0027 - the amount of aluminum in grams, corresponding to 1 ml 0.1 n-solution;

$V_{AlR_3}$  - volume of the solution  $AlR_3$  in ml to be investigated.

There are 3 figures, 1 table, and 9 references, 2 of which are Soviet.

ASSOCIATION: Kafedra tehnologij osnovnogo organicheskogo sinteza i SK Yaroslavskogo tekhnologicheskogo instituta (Chair of Technology of Elements for Organic Synthesis and SK at the Yaroslavl Technological Institute)

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SOV, 196-58-4-40/49

The Determination of the Activity of Trialkyl Aluminum in the Reaction of  
Stereoregulatory Polymerization

SUBMITTED: May 14, 1958

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A006/A001

15.9220

Translation from: Referativnyy zhurnal, Khimiya, 1960, No. 8, p. 544, # 33151

AUTHORS: Tsaylingol'd, V.L., Farberov, M.I., Epshteyn, V.G., Lazaryants,  
E.G., Boguslavskiy, D.B., Bugrova, G.A., Uzina, R.V.

TITLE: Vinyl-Pyridine Rubbers and Latexes and Outlooks on Their Use

PERIODICAL: Yaroslavl'sk. prom-st' (Sovnarkhoz Yaroslavl'sk, ekon. adm. r-na),  
1958, No. 5, pp. 22-25

TEXT: Copolymers of butadiene and 2-methyl-5-vinyl pyridine (VPK) were obtained at 50 and 5°C polymerization temperature and studied. Resistance to wear and heat generation of VPK-vulcanized rubbers exceeds considerably that of vulcanized products from butadiene-styrene rubbers (SKS). Rubbers containing 10-15% 2-methyl-5-vinyl-pyridine have high quality characteristics. Impregnation of cords with VPK latexes ensures high adhesion strength of viscose and caprone cords with natural, SKB and SKS rubbers. Compared to standard SKS impregnation, VPK impregnation increases the adhesion strength of rubber and

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Vinyl-Pyridine Rubbers and Latexes and Outlooks on Their Use

cord by a factor of 1.5-2 under static conditions and much more under dynamic conditions. VPK, polymerized at 5°C exceeds the quality of analogous polymers obtained at 50°C.

O.T.

Translator's note: This is the full translation of the original Russian abstract.

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5(1, 3)

SOV/153-58-5-16/28

AUTHORS:

Farberov, M. I., Ustavshchikov, B. F., Kut'in, A. M.,  
Vernova, T. P., Yarosh, Ye. V.

TITLE:

Technical Synthesis of 2-Methyl-5-Ethyl Pyridine and  
2-Methyl-5-Vinyl-Pyridine, and Their Fields of Application  
(Tekhnicheskiye sintezy 2-metil-5-etilpiridina i 2-metil-5-  
vinilpiridina i oblasti ikh primeneniya)

PERIODICAL:

Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya  
tekhnologiya, 1958, Nr 5, pp 92-99 (USSR)

ABSTRACT:

The authors took the synthesis of 2-methyl-5-ethyl pyridine  
(MEP) from acetaldehyde and ammonia with a further dehydro-  
genation to 2-methyl-5-vinyl pyridine (MVP) as a basis for  
the working out of technical synthesis of these two substances.  
The papers recently published in patents (Refs 11-13) tend to  
show an intense elaboration of these reactions. There are,  
however, no publications on the first, and especially on the  
second stage of this process. The authors first clarified the  
most important rules governing the reaction between acetaldehyde  
and ammonia for the purpose of an industrial utilization.

1) Synthesis of 2-methyl-5-ethyl  
pyridine. Acetaldehyde is used as paraldehyde. This

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Technical Synthesis of 2-Methyl-5-Ethyl Pyridine and 2-Methyl-5-Vinyl Pyridine,  
and Their Fields of Application

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offers much higher yields. Stoichiometric ratios (1.33 mol paraldehyde per 1 mol ammonia) could, however, not secure a sufficiently high MEP yield. The optimum ratio amounts to at least 4 mol ammonia per 1 mol paraldehyde. The presence of larger quantities of water has a favorable effect. The opinions on the formation mechanism of MEP in literature contradict each other (Ref 14). Up to 30 different salts, among them  $ZnCl_2$ ,  $FeCl_2$ ,  $SbCl_3$ ,  $CoCl_2$ ,  $NiCl_2$ ,  $CH_3COONa$ ,  $NH_4Cl$ ,  $CH_3COONH_4$ ,  $NH_4F$ ,  $NH_4F \cdot HF$ ,  $KF$ ,  $KHF_2$  and others served as catalysts. A catalyst was selected which corresponds to the technical process. Its concentration usually amounts to 1-2% of the paraldehyde. The reaction takes also place without catalyst, however, with much smaller yields.

2) Dehydrogenation of 2-methyl-5-ethyl pyridine. Synthesis of 2-methyl-5-vinyl pyridine. The best industrial dehydrogenating catalysts served for dehydrogenation: K-10 and K-12, which consist of zinc oxide, chromium oxides, iron and aluminum oxides, activated with potassium oxide. The partial pressure is

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